Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Commercially produced optical fibers or other waveguides having modeled tap structures for generating a desired illumination pattern, comprising:

one or more optical fibers or other waveguides for receiving light; and

~~one or more~~at least two modeled tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the ~~one or more~~ modeled tap structures ~~directs~~ direct the light in predetermined directions so as to create ~~a~~ the desired illumination pattern by scattering, diffraction, reflection and/or refraction of portions of the light out of the one or more optical fibers or other waveguides, wherein the ~~one or more~~ modeled tap structures ~~is~~ are formed by using pattern parameters determined by modeling the desired illumination pattern, and wherein a parameter of each of the modeled tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

2. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the illumination pattern is generally spherical in shape.

3. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the illumination pattern is generally in the shape of an arc.

4. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the illumination pattern is generally cylindrical in shape.

5. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the illumination pattern is generally conical in shape.

6. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, further comprising:

one or more reflective surfaces disposed within the one or more optical fibers or waveguides, wherein the one or more reflective surfaces reflects the light so that the reflected

beam of light travels in a direction substantially opposite to the original direction of travel of the light.

7. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures ~~has~~ have an asymmetrical geometry.

8. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures ~~extends~~ extend radially in an arc or completely around the one or more optical fibers or waveguides.

9. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures each ~~comprises~~ comprise a continuous circular tap structure.

10. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures ~~comprises~~ comprise a plurality of modeled tap structures which are arranged in an array extending along a length of the one or more optical fibers or waveguides.

11. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures each has a length extending in a longitudinal direction of the respective optical fiber or waveguide larger than a width extending in a radial direction of the respective optical fiber or waveguide.

12. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, further comprising:

one or more light sources that provides the light to the one or more optical fibers or waveguides.

13. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources comprises one or more selectively controllable light sources.

14. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 13, wherein the one or more selectively controllable light sources has varying illumination powers.

15. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources provides at least partially coherent light to the one or more optical fibers or waveguides.

16. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources provides incoherent light to the one or more optical fibers or waveguides.

17. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources provides visible light to the one or more optical fibers or waveguides.

18. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources provides UV light to the one or more optical fibers or waveguides.

19. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources provides infrared light to the one or more optical fibers or waveguides.

20. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 12, wherein the one or more light sources comprises one or more lasers.

21. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 20, wherein the one or more light sources comprises one or more semiconductor laser diodes.

22. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 20, wherein the one or more light sources comprises one or more high power laser diodes.

23. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 20, wherein the one or more light sources comprises one or more light emitting diodes.

24. (Currently Amended) Commercially produced optical fibers or other waveguides having modeled tap structures for creating a desired illumination pattern, comprising:

one or more optical fibers or other waveguides for receiving light; and

~~one or more~~at least two continuous modeled tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or

more optical fibers or waveguides, the ~~one or more~~ continuous modeled tap structures ~~directs~~ direct the light in predetermined directions so as to create ~~a~~ the desired illumination pattern by scattering, diffraction, reflection and/or refraction of portions of the light out of the one or more optical fibers or other waveguides, wherein the ~~one or more~~ continuous tap structures ~~is~~ are formed by using pattern parameters determined by modeling the desired illumination pattern, and wherein a parameter of each of the modeled tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

25. (Currently Amended) Commercially produced optical fibers or other waveguides having modeled tap structures, comprising:

one or more optical fibers or other waveguides for receiving light; and

~~one or more~~at least two modeled tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the ~~one or more~~ modeled tap structures ~~directs~~ direct the light in predetermined directions so as to optimize an amount of the light output out of the one or more optical fibers or other waveguides, wherein the ~~one or more~~ modeled tap structures ~~is~~ are formed by using pattern parameters determined by modeling an illumination pattern configured for optimized light output, and wherein a parameter of each of the modeled tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

26. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 25, wherein greater than approximately 90% of the light is output out of the one or more optical fibers or other waveguides.

27. (Currently Amended) Commercially produced optical fibers or other waveguides having modeled tap structures, comprising:

one or more photon channeling structures for receiving photons; and

~~one or more~~at least two modeled tap structures formed in the one or more photon channeling structures configured so that, when the photons travel through said photon channeling structures, the ~~one or more~~ modeled tap structures ~~directs~~ direct the photons in predetermined directions so as to create a desired pattern by scattering, diffraction, reflection and/or refraction of photons out of the one or more photon channeling structures, wherein the ~~one or more~~ modeled tap structures ~~is~~ are formed by using pattern parameters determined by modeling the desired pattern, and wherein a parameter of each of the modeled tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

28. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures accordingly to claim 27, wherein the photons comprise light.

29. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures accordingly to claim 27, wherein the photons comprise incoherent radiation.

Claims 30-35. (Canceled)

36. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the ~~one or more~~ modeled tap structures ~~comprises~~ comprise a plurality of modeled tap structures of a specific shape, depth, and spacing configured by the modeling process to create a desired illumination pattern based on a particular application.

37. (Currently Amended) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 25, wherein the ~~one or more~~ modeled tap structures ~~comprises~~ comprise a plurality of modeled tap structures of a specific shape, depth, and spacing configured by the modeling process to create a desired illumination pattern based on a particular application.

38. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the tap structures are modeled using an iterative process.

39. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 1, wherein the tap structures are modeled using a theoretical modeling process.

40. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 24, wherein the tap structures are modeled using an iterative process.

41. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 24, wherein the tap structures are modeled using a theoretical modeling process.

42. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 25, wherein the tap structures are modeled using a iterative process.

43. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 25, wherein the tap structures are modeled using a theoretical modeling process.

44. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 27, wherein the tap structures are modeled using an iterative process.

45. (Previously Presented) The commercially produced optical fibers or other waveguides having modeled tap structures according to claim 27, wherein the tap structures are modeled using a theoretical modeling process.

46. (Currently Amended) An apparatus comprising:

one or more optical fibers or other waveguides for receiving light; and

~~one or more~~ at least two tap structures formed in the one or more optical fibers or waveguides configured so that, when the light travels through said one or more optical fibers or waveguides, the ~~one or more~~ tap structures ~~directs~~ direct the light in predetermined directions so as to create a desired illumination pattern by scattering, diffraction, reflection and/or refraction of portions of the light though the one or more optical fibers or other waveguides, wherein a majority of the light emitted out of the one or more optical fibers or other waveguides does not exit the one or more optical fibers or other waveguides through the ~~one or more~~ tap structures,

and wherein a parameter of each of the modeled tap structures is determined based on an effect that all previous tap structures, along a propagation direction of the light, have on a propagation of the light.

47. (Currently Amended) The apparatus according to claim 46, wherein the majority of the light emitted through the one or more optical fibers or other waveguides is directed in a direction toward a substantially opposite side of the one or more optical fibers or other waveguides from a portion of the light that passes through the ~~one or more~~ tap structures.

48. (Currently Amended) The apparatus according to claim 46, wherein the one or more optical fibers or other waveguides comprises one or more optical fibers and the ~~one or more~~ tap structures ~~is~~ are formed in ~~the~~ a cladding and at least a portion of ~~the~~ a core.